



**METHOD AND APPARATUS FOR REDUCING THE CALCIUM AND
PHOSPHOROUS RATIO AND INCREASING PROTEIN IN SHELLFISH
WASTE MEAL**

CROSS REFERENCE TO RELATED APPLICATIONS

FIELD OF THE INVENTION

This invention relates to a method and apparatus for the processing of shellfish waste meal (SWM). More particularly, to increasing the crude protein while decreasing calcium and phosphorus levels of SWM. The method significantly reduces the percent calcium and phosphorous in shellfish waste meal while lowering the ratio of calcium to phosphorous and raising or maintaining protein levels. These findings make the waste meal a more viable economical protein source in fertilizer and livestock rations.

BACKGROUND OF THE INVENTION

Proper disposal of aquatic waste is a growing environmental problem for the aquaculture industry in Louisiana and other coastal areas of the United States. Freshwater Crawfish (*Procambarus clarkii*) and the White River Crawfish (*Procambarus zonangulus*) are important commercial commodities in Louisiana. Louisiana produces over 90% of the crawfish harvested in the United States. The state's aquaculture industry has over 100 crawfish shrimp and crab processing plants. These plants bag the shellfish for sale and or extract the tail meat from the millions of pounds processed at the plants. Of the amount of shellfish harvested each year, approximately 85% (34 to 85 million pounds) is classified as crawfish waste. Analogously, of the crab, and

Other features and advantages of the present invention will be apparent from the following description in which the preferred embodiments have been set fourth in conjunction with the accompanying drawings.

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BRIEF DESCRIPTION OF THE DRAWINGS

In describing the preferred embodiments of the invention reference will be made the series of figures and drawings briefly described below.

Figure 1 shows schematic of the process flow diagram.

Figure 2 continues the process flow diagram of the method.

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Figure 3 shows the process using crawfish waste meal.

Figure 4 continues the process flow diagram of fig. 3.

Figure 5 shows the separator.

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There may be additional structures described in the foregoing application which are not depicted on one of the described drawings. In the event such a structure is described but not depicted in a drawing, the absence of such a drawing should not be considered as an omission of such design from the specification.

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DETAILED DESCRIPTION OF THE INVENTION

In the following description, the present invention will be described in this embodiment as a process for producing shellfish meal. Those skilled in the art will readily recognize that the equivalent of such process and its applicability for all crustaceans.

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Referring to figures 1 and 2 step 1 (100),dried material of SWM is introduced into the process flow. Step 2 (110), the SWM is loaded into a mechanical or electrical feed separator. Step 3 (120), the separator allows small pieces of SWM to fall into a collection pan. The separator has a mesh screen with 3/16 inch openings. The pieces of SWM that are larger than 3/16 inches are sent to a grinder (122) and returned to the separator. Step 4(130), the pieces which are

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